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## INTELLIGENCE MEMORANDUM

SOUTH VIETNAM: THE STRUCTURE AND PATTERN  
OF TELECOMMUNICATIONS IN A WAR ENVIRONMENT

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**W A R N I N G**

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FOREWORD

This memorandum describes and appraises the status of all telecommunications systems presently operational in South Vietnam, excluding those of the Viet Cong. Major emphasis is given to an examination of the national common carrier system -- upon which the general population must primarily rely -- but considerable attention also is accorded to military and paramilitary communications networks which furnish a basis of indispensable support to the prosecution of counterinsurgency operations.

Despite the extensive nature and high level of hostilities, ambitious programs and proposals for telecommunications development are under consideration which, if implemented, would change fundamentally the current status of telecommunications in South Vietnam. This memorandum explicitly treats only those programs and proposals which appear to be capable of realization within the reasonably near future and ignores those which are of a longer run or more uncertain character.

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SOUTH VIETNAM: THE STRUCTURE AND PATTERN  
OF TELECOMMUNICATIONS IN A WAR ENVIRONMENT\*

Summary

As in most less developed countries, the national common carrier telecommunications system of South Vietnam is very primitive. Telephone and telegraph services are grossly inadequate to meet current requirements and remain uniformly unsatisfactory throughout the country; in many areas such services are virtually nonexistent below the district level. The primary means of long-distance communications consists of manual Morse passed over high frequency (HF) radio, and telephone exchange capacity is extremely limited. Furthermore, the potential of radiobroadcasting -- virtually the sole medium of mass communications intelligible to a population whose illiteracy rate is estimated at 50 percent or more -- is severely impaired by the scarcity of radiobroadcast reception facilities. There is probably not more than one radio receiver for every 50 inhabitants in South Vietnam.

In marked contrast to the civil communications sector, priority emphasis in recent years has led to the installation of well-developed communications networks for the prosecution of military and paramilitary operations. For primarily military use, a network of tropospheric scatter and radio relay facilities installed by US military forces represents the best-developed communications system in South Vietnam. This network furnishes high-capacity voice and teleprinter communications to all major US military units and is scheduled for extensive improvements. For paramilitary use, substantial US assistance has brought about the formation of the

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\* This memorandum was produced by the Office of Research and Reports; the estimates and conclusions represent the best judgment of the Directorate of Intelligence as of 15 April 1966.

Combined Telecommunications Directorate (CTD) under the South Vietnamese Ministry of Interior; the CTD now provides multichannel communications on a nationwide basis to paramilitary units in most provincial and district capitals. Below the district level, the widespread distribution of small, short-range radio transceivers makes possible voice communications from various headquarters in the CTD structure to 2,500 villages and 7,500 hamlets.

US-sponsored programs to develop the telecommunications sector currently under way or planned include high-capacity transmission systems, modern telephone exchanges, and an enlarged radiobroadcast reception base. Thus far, however, the Viet Cong insurgency as well as a shortage of skilled telecommunications technicians and managers has presented a serious obstacle to successful telecommunications development, and the creation of a modern telecommunications sector in South Vietnam remains a task of major magnitude.

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## I. Civil Telecommunications

The civil telecommunications system in South Vietnam is operated as a governmental enterprise. Direct responsibility for the control, operation, and maintenance of the system resides in the General Directorate of Posts and Telecommunications (GDPT), an agency of the Ministry of Public Works and Communications. The GDPT employs approximately 3,000 people, many of whom serve only on a part-time basis.

In spite of fairly substantial US technical and financial assistance -- valued at US \$10 million since 1958 -- the civil telecommunications system scarcely meets the minimal needs of South Vietnam's population of almost 16 million people.\* There are fewer than 25,000 telephones, the system relies heavily on HF radio, and manual Morse is the primary transmission mode for long-distance communications.

In recognition of the present serious shortcomings of civil telecommunications and of the important role that a well-developed telecommunications system can play in ideological warfare, US-sponsored programs directed at the improvement and expansion of civil telecommunications are under way or planned on a broad front. The most important programs envision the installation of telephone exchanges in 21 provincial cities, the expansion of the radiobroadcast system, the establishment of a nationwide television broadcast network, and the creation of a high-capacity radio relay system ultimately to traverse the entire country from Hue to Khanh Hung. Given continuing US assistance, such projects in the short term promise to improve materially the existing telecommunications base. Lasting improvement, however, is predicated on the development of a native cadre of skilled telecommunications managers and technicians -- a prospect, according to a recent authoritative study, made credible only by placing the telecommunications industry on a private enterprise footing.

### A. Telecommunications Transmission and Exchange Facilities

#### 1. High-Frequency Radio

High-frequency radio is the major medium of civil telecommunications in South Vietnam. A primary radio center in Thu Duc

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\* All references to population and per capita ratios for South Vietnam are based on a population estimate of 15.7 million people as of mid-year 1964.



near Saigon and 25 secondary radio centers (of which Dalat, Hue, Nha Trang, and Da Nang are the most important) provide communications to all areas of the country (see Figure 1). An undetermined number of additional HF radio stations of small size and very limited capability provide local service in rural areas. In all, an estimated 750 HF radio circuits are in use by nonmilitary subscribers throughout South Vietnam. Manual Morse and voice are the prevalent modes of HF transmission on these circuits, but automatic Morse and high-speed teleprinter also are available on the more important circuits.

## 2. Wirelines and Cables

Wirelines are used primarily for intracity communications in South Vietnam. As Figure 1 indicates, interurban wirelines are very sparse and, even where they do exist, are often not operational. An extensive interurban wireline network was established under French colonial administration, but recurrent acts of sabotage have eliminated wirelines as an important segment of the telecommunications system in South Vietnam. The few wirelines that may be operational have a very limited transmission capability, on the order of 1 to 4 channels.

Telecommunications cables in South Vietnam exist only within several of the major cities, where they are used for trunking and distribution. There are no long-distance telecommunication transmission cables in the country.

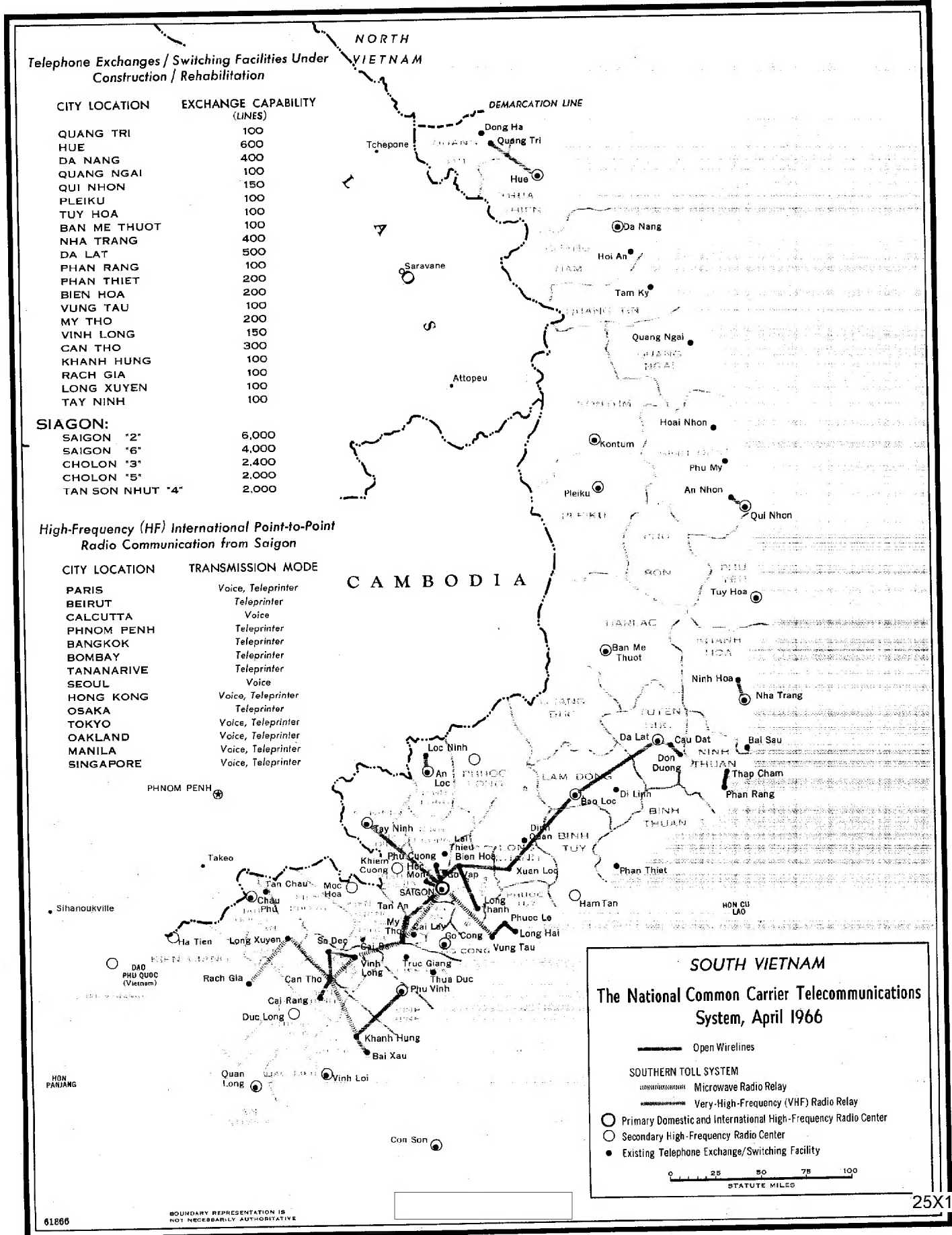
## 3. Radio Relay

A microwave radio relay system, known as the Southern Toll System, represents the only high-capacity, common carrier telecommunications system in South Vietnam. Installed in 1964 at a cost of approximately \$3 million, the Southern Toll System provides connections between Saigon and terminals located in My Tho, Vinh Long, Can Tho, Long Xuyen, Rach Gia, Vung Tau, and Khanh Hung (see Figure 1). Very high-frequency (VHF) radio feeder lines radiate outward from several of the above-named cities to larger towns in the surrounding areas.

Although designed to accommodate 600 voice channels, the Southern Toll System is equipped at present to handle only 156 voice channels and 64 teleprinter circuits.\* Of this number, only 82 voice

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\* By using appropriate multiplex equipment, one voice channel can be subdivided to accommodate 24 telegraph circuits simultaneously.



channels and 12 teleprinter circuits are in actual use. Voice channels are shared primarily by the GDPT, the Republic of Vietnam Armed Forces (RVNAF), and US military forces with 30, 27, and 18 voice channels, respectively. Eight of the 12 teleprinter circuits are used by the GDPT, and the remaining four are assigned to the RVNAF.

#### 4. Exchange and Switching Facilities

Telephone exchange capacity in South Vietnam totals less than 12,000 operational lines -- of which 8,400 lines, or 70 percent of current exchange capacity, are in the Saigon/Cholon area -- and is grossly inadequate to meet current civil requirements. The residual is accounted for by about 60 very small exchanges and switchboard facilities scattered throughout the country (see Figure 1).

In 1962 the US Agency for International Development (AID) launched a program to establish or rehabilitate telephone exchanges in Saigon and 21 provincial cities. This program is now well along, with completion scheduled during 1966-67. Three large exchanges under construction in Saigon/Cholon range in size from 2,000 to 4,000 lines. These facilities will raise exchange capacity in the immediate Saigon area to 16,400 lines, an increase of almost 100 percent. An additional 4,200 lines will be provided by the exchanges under construction in the provincial capitals.

Of the 21 provincial exchanges, those at Can Tho, Nha Trang, Dalat, Qui Nhon, and Da Nang also will serve as switching centers for two to five smaller exchanges in their respective regions. Communications between the provincial switching centers and smaller exchanges will be by means of HF or VHF radio. Several channels on RVNAF or US military transmission facilities will be reserved for GDPT use between the switching centers and Saigon. Within the Saigon area, interconnections between the switching centers will be possible, thus affording a basis for network communications among 22 cities.

#### B. Telephone and Telegraph Services

Telephone service is very poorly developed. In 1964 there were slightly more than 20,000 telephone sets in use, reflecting an average increase of 500 telephone sets per year since 1960. The telephone system handled approximately 30 million local telephone calls and 365,000 interurban calls during 1964. This equates to an annual average of two local calls per person and to less than one long-distance call per year for every three persons in the country.

Telephone rates ranged from five piasters\* for a three-minute local call to from 10 to 100 piasters for a long-distance call. Telephone installations fees currently range from 5,000 to 10,000 piasters or more, depending on the distance from the telephone exchange.

Telegraph service also is poorly developed but is somewhat more accessible to the rural population. Fifty-one telegraph stations were operational in 1964, transmitting an average of 2,700 telegrams daily. The minimum rate for telegrams is fixed at 20 piasters for 10 words.

### C. Functional Communications Systems

Both the Directorate of Civil Aviation and the Directorate of Meteorology operate functional communications systems to meet national requirements for the control of air traffic and weather reporting.\*\* Although both directorates rely, for the most part, on their own communications equipment -- primarily HF point-to-point radio -- they also have routine access to transmission facilities made available for the GDPT and US military forces.

The Directorate of Civil Aviation operates a well-developed network that includes HF radio stations in Saigon, Hue, Da Nang, Qui Nhon, Ban Me Thuot, Pleiku, Dalat, and Nha Trang. Saigon is the hub of domestic aeronautical communications and has direct voice and manual Morse connections to all domestic airports. In addition, a major communications facility for international aeronautical communications is located at Saigon's Tan Son Nhut Airport. From Tan Son Nhut, manual Morse connections extend to Vientiane and Phnom Penh,

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\* South Vietnam uses multiple exchange rates for various transactions. These include a seldom-used official exchange rate of 35 piasters to US \$1; a trade rate of 60 piasters to US \$1; an "invisible transactions" rate of 73 piasters to US \$1; and, for US military forces, a military scrip rate of 118 piasters to US \$1. The black market rate is approximately 170 piasters to US \$1.

\*\* The Railways Administration also maintains an independent communications system but its operational status is uncertain at present. This system uses both wire and radio facilities to provide communications along South Vietnam's 750 miles of railroad trackage. As of 15 April 1966, however, a concerted Viet Cong effort to interdict rail transportation had reduced operational rail trackage to five sections: Saigon-Xuan Loc; Ca Na-Phan Rang; Dalat-Phan Rang; Nha Trang-Ninh Hoa; and Da Nang-Hue.

duplex teleprinter and voice to Hong Kong and Bangkok, and voice and manual Morse to Manila.

The Directorate of Meteorology maintains a network of 12 point-to-point radio stations and a radiobroadcast station that transmits in automatic Morse. This network disseminates meteorological information obtained from 22 weather observation centers located in all parts of the country. These meteorological communications radiate outward from Saigon, which has direct voice connections on the mainland to Hoang Sa, Quang Ngai, Pleiku, Qui Nhon, Tuy Hoa, Bac Loc, Phan Thiet, Rach Gia, Quan Long and also to the islands of Phu Quoc and Con Son. Telecommunications facilities of the US military forces and the Directorate of Civil Aviation also are used extensively for weather reporting purposes.

#### D. International Communications

Civil international communications from South Vietnam are conducted entirely by HF radio. Two transmitting stations on the outskirts of Saigon (Phu Tho and Chi Hoa) and two receiving stations in central Saigon provide international communications to 14 cities in North America, Europe, Africa, and Asia. Saigon has major connections by simultaneous teleprinter and voice communications to Manila, Paris, Singapore, Hong Kong, Oakland, and Tokyo (see Figure 1). Teleprinter circuits also are available to Bangkok, Beirut, Bombay, Osaka, Phnom Penh, and Tananarive, and voice connections exist to Calcutta and Seoul.

During 1964, international communications facilities handled an average of 1,400 telegrams daily. This is slightly more than 50 percent of the average rate of transmission of domestic telegrams. There is no reliable estimate for the annual volume of international voice communications, but at least 75 percent of all domestic telephone sets are known to be integrated into the international communications system.

A large international receiving center at My Tho has been under construction since 1962. When completed, this new center will improve appreciably South Vietnam's capability to receive international HF radio communications. Despite continuing Viet Cong harassment and the failure of Vietnamese officials to insure adequate site security, the My Tho center is scheduled to become operational in 1966.

### E. Broadcasting

Radiobroadcasting in South Vietnam is characterized by a fairly well-developed complex of transmission facilities in juxtaposition to a poorly developed radio reception base. Under the administration of the Directorate of Radio, an organ of the Ministry of Information, a national network of eight medium-frequency (MF) broadcast stations reaches about 50 percent of the area of the country, containing an estimated 70 percent of the population (see Figure 2). Five HF broadcast stations provide supplementary coverage to isolated population centers in mountainous areas. In contrast to this relatively powerful transmission capability, there is probably not more than one receiver for every 50 inhabitants, and these are heavily concentrated in major urban centers. At present, television broadcasting is in an early stage of development and is limited to the Saigon area.

#### 1. Radiobroadcast Transmission Facilities

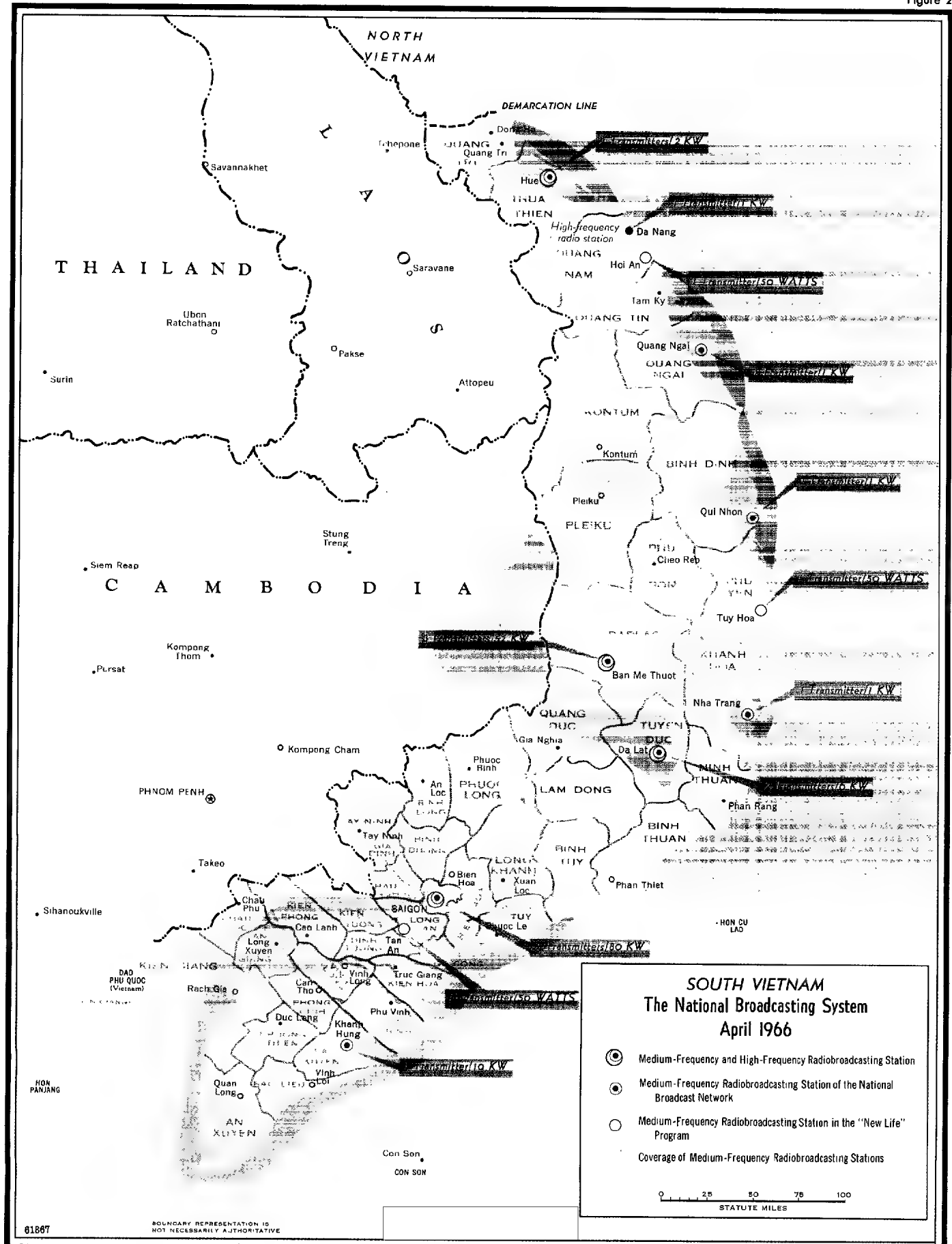
South Vietnam uses 22 transmitters -- 14 MF and 8 HF transmitters with an aggregate power of 250 kilowatts (kw) -- for civil radiobroadcasting.\* At least nine MF transmitters are regularly used by eight radio stations\*\* that are linked in a national broadcast network wherein programs originating in Saigon are rebroadcast in Soc Trang, Dalat, Nha Trang, Ban Me Thuot, Qui Nhon, Quang Ngai, and Hue. Each network station also can originate and broadcast its own local programs. Eighty percent of all programing is in Vietnamese, but programs in English, French, and Chinese also are broadcast.

Three of the 22 radiobroadcast transmitters in South Vietnam were set up in Quang Ngai, Phu Yen, and Long An Provinces as part of the so-called "New Life Program" administered by AID. The aim of this program was to cultivate the allegiance of the rural populace by using low-power (50-watt) transmitters to broadcast programs of local interest and origin along with a heavy dose of political information. Under original plans, 25 province capitals were to be equipped with such transmitters, but the program is currently under review because of difficulties arising from the intensification of hostilities.

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\* Other radiobroadcasting transmitters, not used for conventional civil broadcasting, also are operational in South Vietnam. The most important include a Voice of America facility at Hue and several transmitters serving US and South Vietnamese military forces.

\*\* A radio station may use one or more transmitters for expanded broadcast coverage.



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## 2. Radiobroadcast Reception Facilities

At present there are an estimated 300,000 radio receivers for South Vietnam's population of almost 16 million. This is well below the ratio of 5 sets per 100 inhabitants suggested by UNESCO as the level of minimum adequacy in less developed areas and is far below the ratio of 30 or more sets per 100 inhabitants characteristic of advanced countries.

Low per capita income is clearly an important reason for the small number of receivers, but it is also a result, at least in part, of efforts by past Saigon governments to insulate the population of South Vietnam from North Vietnamese propaganda. Accordingly, the availability of receivers was heavily restricted through imposition of expensive import licensing fees and annual subscription fees for radio ownership. Within the last two years, however, this policy was abandoned, and the US Operations Mission has organized and directed a program to develop a radio reception base more nearly commensurate with the country's transmission capabilities. Under this program, about 100,000 new receivers have been brought into South Vietnam thus far, and plans call for an additional 100,000 receivers to be imported during the next several years.

## 3. Television Broadcasting

Television broadcasting was introduced to South Vietnam in February 1966. At present a US Navy Superconstellation aircraft circling 12,000 to 15,000 feet above Saigon serves as the sole transmitting platform for 500 television sets distributed by AID to military recreation halls and community centers in the Saigon area. Programs are broadcast over two channels, and total programming amounts to about five hours daily. Current plans call for a television station to be installed in Saigon within six months, and longer range plans envision the eventual establishment of a national television network of at least eight television stations.

## II. Paramilitary Communications Systems

In 1961 the Combined Telecommunications Directorate was established within the Ministry of the Interior to provide a centralized communications system for civil security/paramilitary operations in South Vietnam. With a staff of 3,000 people, the directorate provides communications support on a nationwide basis to the Regional Forces, the Popular Forces, the National Police, and various elements within

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the Ministry of Interior (see Figure 3). The communications system of the Combined Telecommunications Directorate, comprised of the administrative radio network and the village/hamlet radio system, serves as a major instrument in the prosecution of counterinsurgency operations and in many areas affords the only means of communications from villages and hamlets to higher levels of administration.

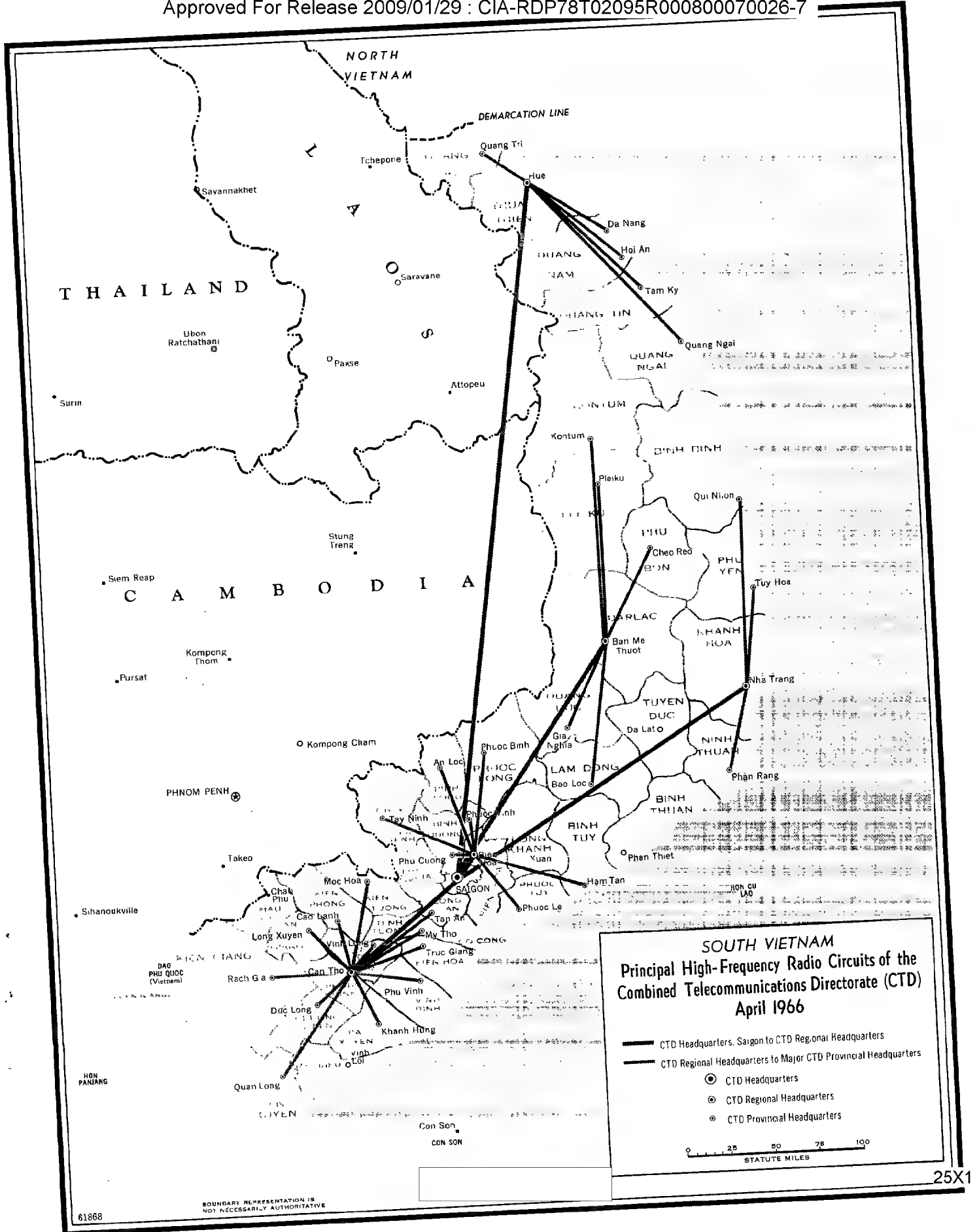
A. The Administrative Radio Network

The administrative radio network furnishes communications from the headquarters of the Combined Telecommunications Directorate in Saigon through 5 regional centers and 43 provincial capitals to paramilitary units in 238 districts. Primary facilities are centered on a large fixed HF radio station at Thu Duc and five regional centers at Bien Hoa, Can Tho, Ban Me Thuot, Nha Trang, and Hue. Transmitters at these centers range in power from 500 watts to 1 kw and provide simultaneous teleprinter, voice, and Morse communications on a multi-channel basis. Teleprinter, voice, and Morse communications also exist from the five regional centers to 43 provincial capitals. Below the provincial level, voice and Morse communications carried over four channels are prevalent.

B. The Village/Hamlet Radio System

The village/hamlet radio system complements the administrative radio network by providing communications between the district level of administration and 2,500 villages and 7,500 hamlets in South Vietnam. The system, inaugurated in May 1963 by the Public Safety Division of the US Operations Mission as an extension of its effort to assist the Vietnamese National Police, is designed around the use of hand-held, single-channel radio transceivers. These transceivers, of which more than 10,000 have been distributed, are capable of two-way voice communications to distances of 30 miles.

In many areas the village/hamlet radio system affords the sole communications outlet from the village to governmental authorities at the district level. It figures prominently in counterinsurgency operations by enabling villages and hamlets to obtain aircraft or artillery support and reinforcement from the government's mobile reserve as required. In addition, the village/hamlet radio system serves to meet the modest requirements for civil communications of the population below the district level which otherwise would remain substantially unfulfilled.



### III. Military Communications Systems

US military forces and each of the three force components of the RVNAF operate independent communications networks in South Vietnam. A high-capacity transmission system using tropospheric scatter and VHF radio relay facilities serves US military forces. The RVNAF -- made up of the Army of Vietnam (ARVN), the Vietnamese Navy (VNN), and the Vietnamese Air Force (VNAF) -- operates independent HF point-to-point radio networks. The ARVN also maintains an extensive VHF radio relay system and is a privileged subscriber to the telecommunications facilities of the GDPT.

#### A. US Military Forces

US military forces operate the best-developed telecommunications system in South Vietnam (see Figure 4). A high-capacity tropospheric scatter system forms the backbone of the US military telecommunications system and provides command and control communications from Headquarters, Military Assistance Command, Vietnam (MACV) in Saigon to major US terminals at Nha Trang, Qui Nhon, Da Nang, and Pleiku. Adjuncts of the system extend to at least 12 other US terminals. This system, the framework of which was established by the US Air Force at a cost of \$20 million, can handle as many as 68 voice and 48 teleprinter circuits simultaneously. Tactical VHF radio relay facilities capable of 24 voice channels furnish supplementary communications; transportable HF point-to-point communications are widely used on tributary routes where communications requirements are less channel-intensive. Manually operated voice and teleprinter switching centers afford interconnections among all major US units. Moreover, there are at least five US military installations in South Vietnam capable of handling data transmission.

The US military requirement for international communications currently is met by a variety of means: a 60-voice-channel submarine cable from Nha Trang to San Miguel, Philippines, which is tied in with a trans-Pacific submarine cable to the US west coast; a HF radio system that provides 3 voice and 16 teleprinter circuits to Bangkok and about 32 teleprinter and 6 voice circuits to communications centers in the Far East for relay to the United States; and tropospheric scatter facilities that afford a total of 96 channels from Pleiku and Vung Tau to terminals at Ubon and Green Mountain, Thailand. A transportable communications-satellite ground station near Saigon also provides two channels for teleprinter and data communications over "Syncom" to Hawaii.

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With South Vietnam at the heart of the planning, the US Department of Defense is moving ahead with a major program to improve and expand its military telecommunications capabilities in Southeast Asia. Designated the Integrated Wideband Communications System (IWCS), the program is being keyed within South Vietnam to satisfying the burgeoning communications requirements of all US and Allied forces. Under the IWCS concept, tropospheric scatter and radio relay facilities will continue to serve as the primary transmission media, but the plan also calls for installation of a submarine communications cable from Saigon to Hue and the use of a more advanced communications satellite system. Concurrently, the program provides for installation of 51 automatic telephone exchanges which, in the aggregate, will increase exchange capacity for US military forces by 31,000 lines. The estimated cost for the IWCS is about \$60 million, and its completion date is set for early 1967.

B. South Vietnamese Ground Forces

Overall command and control of the RVNAF is exercised by the Joint General Staff, subordinate to the Minister of War/Secretary of Defense, from a Joint Operations Center in Saigon. The Joint Operations Center has direct teleprinter connections to at least ten command headquarters. Among the latter are the national headquarters of the ARVN, VNN, and VNAF and ARVN headquarters in each of the four Corps Tactical Zones.

For its use, the ARVN operates dual networks of tactical VHF radio relay and HF point-to-point facilities to support a force of 263,000 personnel (see Figure 5). In combination, these networks provide teleprinter and voice communications from ARVN headquarters, Saigon, to headquarters of the four Corps Tactical Zones at Da Nang, Pleiku, Bien Hoa, and Can Tho. From the four Corps headquarters, communications over these networks extend downward to ARVN units of divisional and regimental echelon. Exchange capacity of ARVN in the immediate Saigon area is reported at 3,000 lines. The number and capacity of exchanges or tactical switchboards for military usage in outlying areas is unknown.

The VHF radio relay system is a tactical system of World War II manufacture capable of transmitting four voice channels. Ordinarily, however, three voice and four teleprinter circuits are used. The HF radio network connects ARVN headquarters at Saigon with Vinh Long, Nha Trang, Ban Me Thuot, Pleiku, Qui Nhon, and Da Nang. This network uses the single side band mode of transmission, which provides improved reliability of communications and higher transmission capacity compared with conventional HF equipment.

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Figure 4

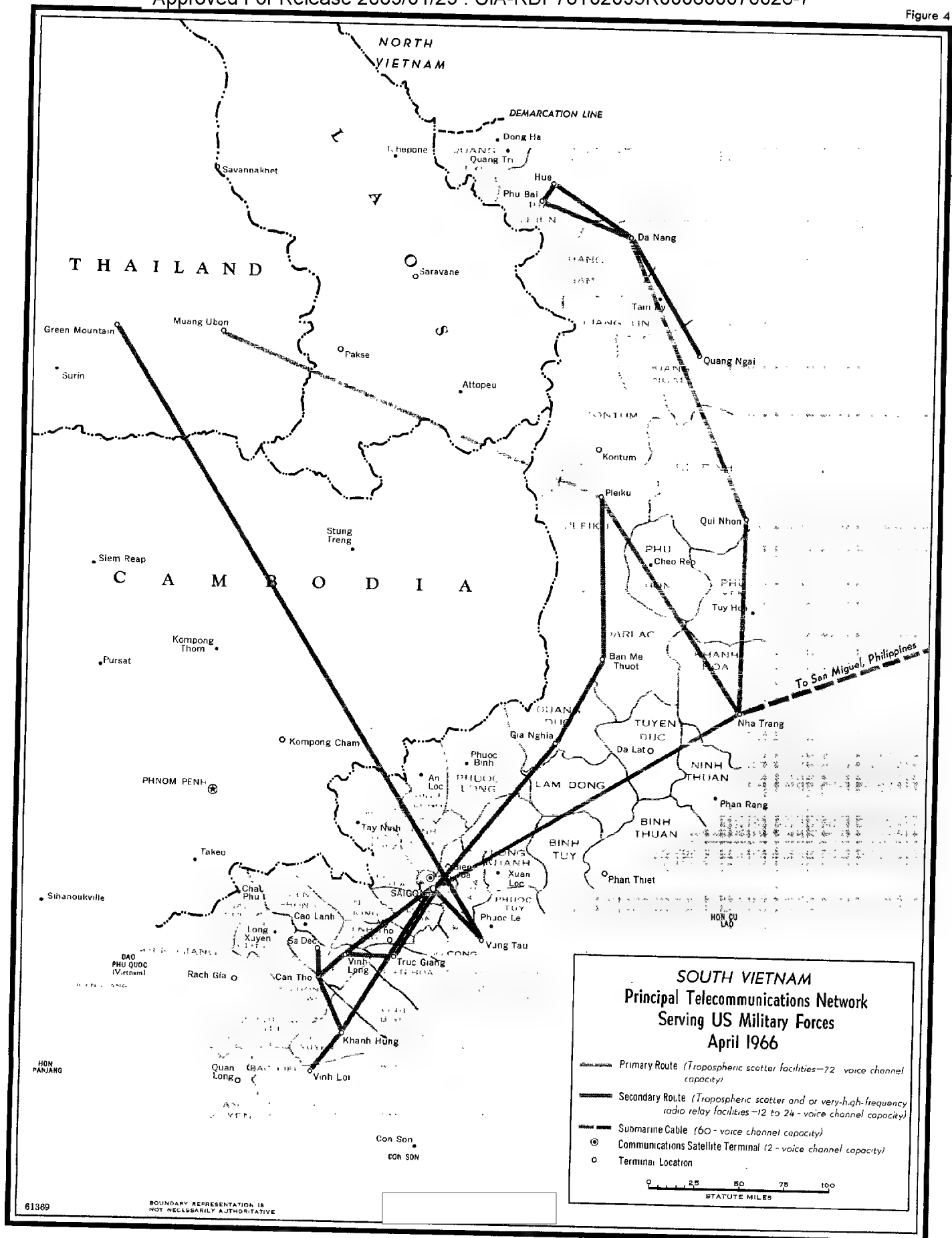
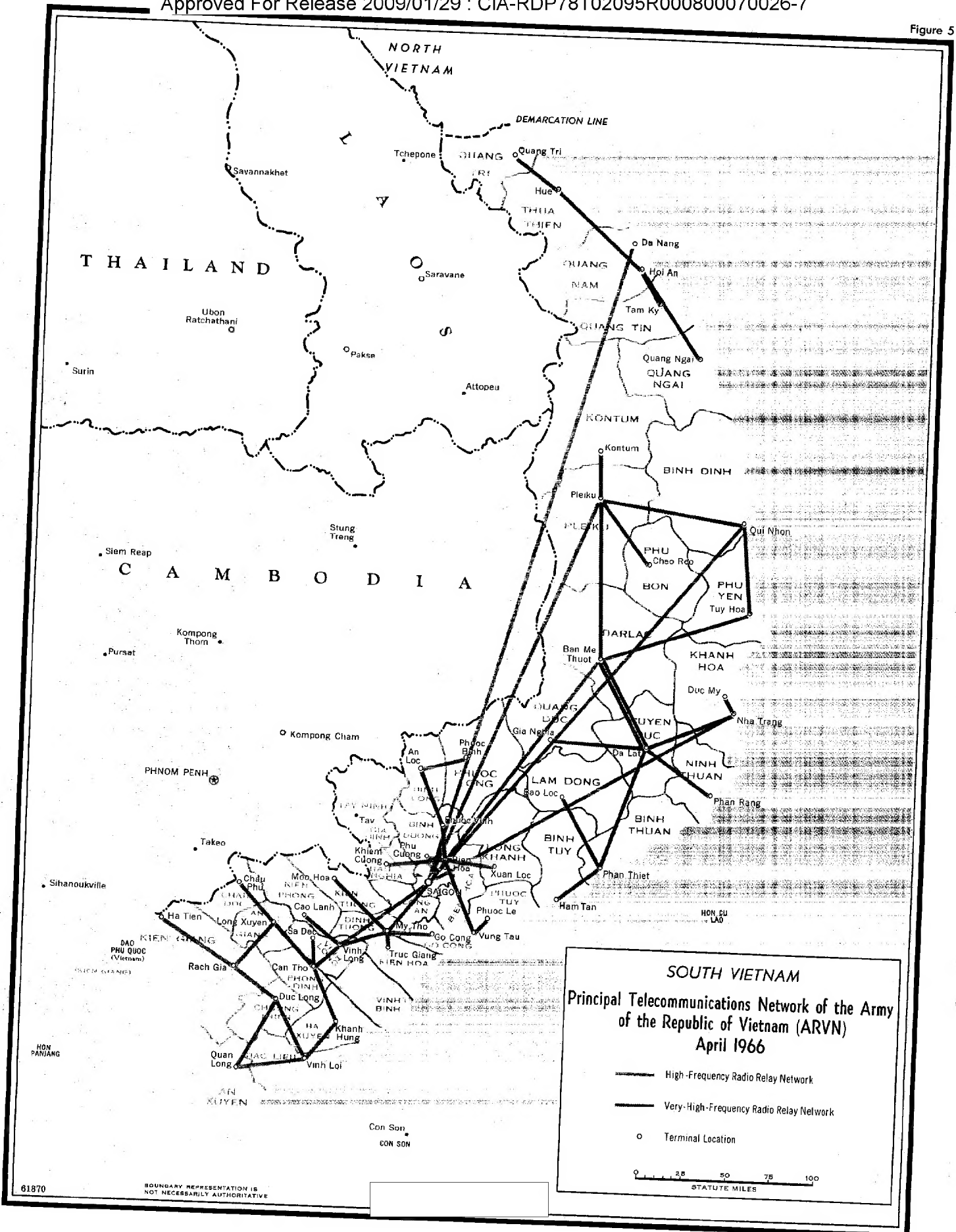


Figure 5



C. The Vietnamese Air Force

The VNAF, with 13,000 personnel and about 400 aircraft of all types, depends primarily on facilities operated by the ARVN, the US, and the Directorate for Civil Aviation for communications support. The VNAF, however, does maintain a HF point-to-point radio network that connects VNAF headquarters at Tan Son Nhut Airport, Saigon, to the five major airfields at Da Nang, Pleiku, Nha Trang, Bien Hoa, and Bien Thuy, as well as to a radar facility at Ban Me Thuot (see Figure 6). This network provides manual Morse from Tan Son Nhut to Pleiku and Ban Me Thuot and manual Morse and teleprinter between Nha Trang, Da Nang, Bien Hoa, and Bien Thuy. Lateral communications by manual Morse exist among the five airfields and the radar facility at Ban Me Thuot. Each of the airfields and Ban Me Thuot have manual telephone exchanges.

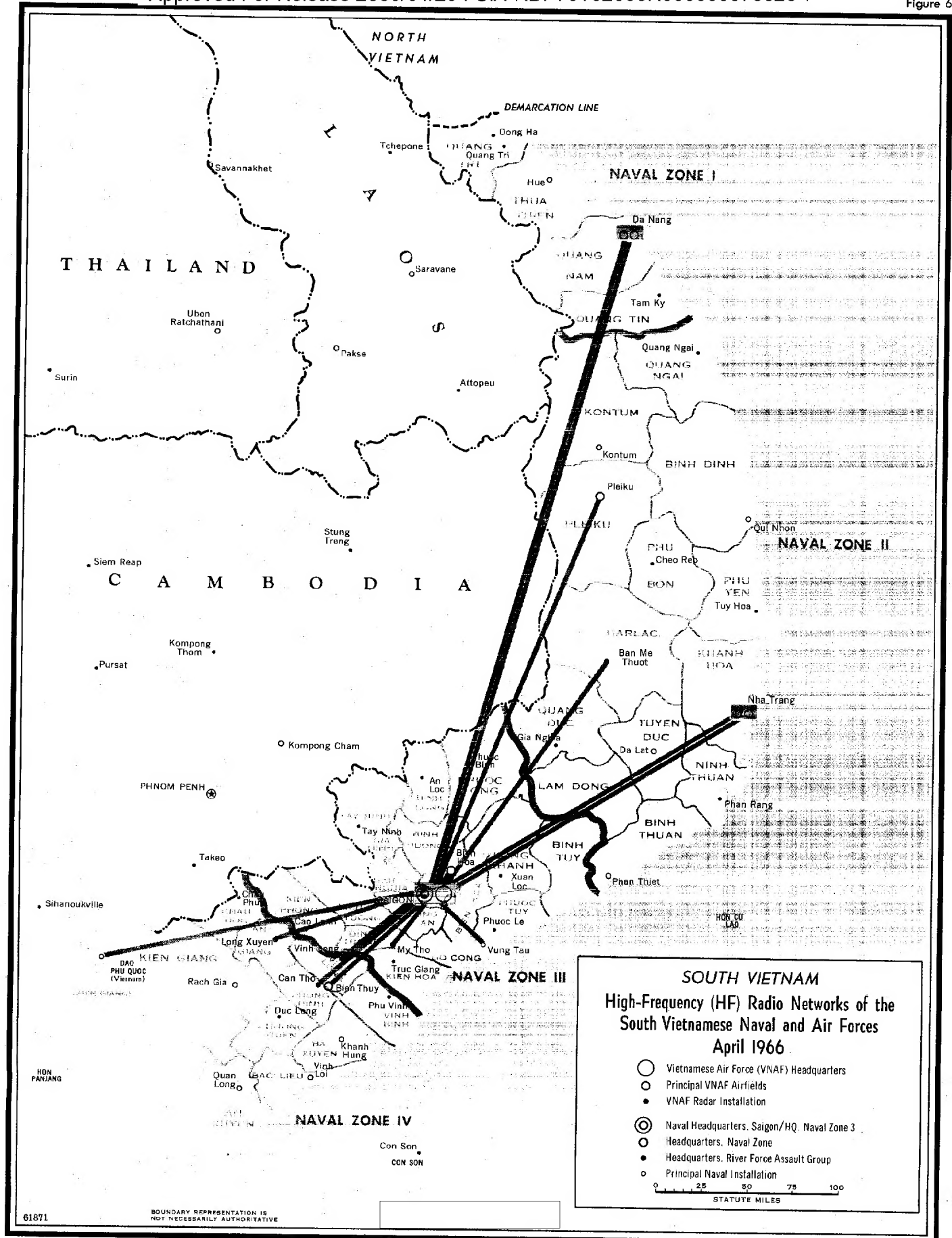
D. The Vietnamese Navy

The VNN, organized into the Sea, River, and Junk Forces, makes extensive use of ARVN communications facilities and two HF radio networks of its own to support a force of 22,000 persons (see Figure 6). \* As the supreme naval authority in South Vietnam, Naval Headquarters in Saigon controls both HF radio networks; one network serves the Sea Force (53 ships) and the other the River Force (180 craft). The Junk Force (500 junks, approximately 50 percent of which are motorized) apparently relies primarily on small VHF transceivers which are integrated with Sea Force communications facilities.

The HF radio network serving the Sea Force affords teleprinter connections from Naval Headquarters, Saigon, to subordinate headquarters in each of the Naval Districts at Da Nang, Nha Trang, Vung Tau, and Phu Quoc Island. Voice and teleprinter connections over the River Force HF radio network extend from Naval Headquarters, Saigon, to the four River Force assault groups in the Mekong Delta at My Tho, Vinh Long, Long Xuyen, and Can Tho. A radiobroadcast station using automatic Morse also is used by Naval Headquarters, Saigon, for the transmission of administrative traffic to all subordinate naval stations.

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\* The Vietnamese Marine Corps of 8,000 personnel is included in the total.





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